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PHYSICAL THERAPY MANAGEMENT OF RODEO INJURIES

By

Edith Ann Ready
Bachelor of Science
University of North Dakota, 1993

An Independent Study

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master of Physical Therapy

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May
1994

This Independent Study, submitted by Edith Ann Ready in partial fulfillment of the requirements for the Degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

Renee Mabrey
(Faculty Preceptor)

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Thomas Mon
(Chairperson, Physical Therapy)

PERMISSION

Title Physical Therapy Management of Rodeo Injuries

Department Physical Therapy

Degree Master of Physical Therapy

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TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

The sport of rodeo is a high risk event. Each event presents unique dangers creating opportunity for injury. The high injury rate calls for medical intervention for these athletes. However, there are a limited number of publications and research relative to medical care for rodeo athletes.

The purpose of this paper is to inform physical therapists about the sport of rodeo, its members, mode of injury and atmosphere surrounding this sport. By increasing awareness, physical therapists will have a better understanding of rodeo and the special challenges it presents.

Several key points will be discussed. The history of rodeo, as well as the history of medical care, will be outlined. Next, high risk rodeo events will be described, the mechanism of injury examined and common injuries identified. Finally, physical therapy intervention will be assessed.

Physical therapists should be aware of the special needs of rodeo athletes in order to treat them effectively. By understanding the mechanism of injury, the cowboy's lifestyle and the physical demands needed to return to the

sport, the physical therapist and rodeo athlete will have common goals creating a successful outcome.

CHAPTER 1

INTRODUCTION

Shortly after the Civil War, cowboys trailed large herds of longhorn cattle from Texas to the northern states. These young men were unique in their lifestyle and attitudes. They have been described as, "men of a particular time and place, living by a code compounded by hardfisted frontier desperation and Victorian-era social values, performing body-punishing and hazardous jobs, and pitting themselves against a land of sweeping grandeur that offered prodigious drafts of misery."[1] In need of a diversion, the cowboys bet their meager wages on their own ability at riding broncs or roping long-horn steers. Thus, rodeo was created, giving the cowboy the opportunity to compete in a sport pitting man against beast.

The ideology behind rodeo has remained mostly unchanged. The sport has prospered throughout the years, and the first professional rodeo organization was established in 1930. Today, rodeo is organized into several levels of competition including professional, collegiate, high school and numerous amateur associations.

Rodeo is a unique sporting event. There is an unequal contest between man and beast; the injury rate is high. These injuries deserve the attention of medical care providers, but the lifestyle of the cowboy impacts treatment and follow-up care.

Medical coverage, including insurance, on-site care as well as follow-up care has greatly increased for rodeo contestants in the last 20 years. However, the great risk of injury the sport of rodeo poses creates a need for physical therapy/sports medicine related medical care. Griffin et al[2] conducted a study collecting data from four different rodeos. He found that 19.7% of the participants sustained injuries, and several of the participants received more than one injury. Meyers et al[3] found that roughstock events had a 6:1 exposure to injury rate, which in turn found that 25% of the roughstock riders were injured.

There is a need for on-site medical attention for these athletes. A rodeo contestant's lifestyle does not afford the luxury of having a training room or those trained in sports injuries available. These athletes travel by their own means, usually consisting of a car or plane for the roughstock riders and a pickup and horse trailer for the timed-event competitors. Only the elite can afford traveling with only one or two other riders. These competitors often travel to rodeos that are hundreds or even thousands

of miles apart and do not slow down long enough to seek professional care of their injuries.

Time and money are two things that most of these athletes are lacking. By having an on-site athletic trainer or physical therapist, these athletes can receive the care they need within their means. Amateur rodeos, especially, have a limited amount of coverage. These athletes are very dedicated to their sport and are responsive to professional opinion.[4] With on-site medical attention, the number of injuries could be decreased, and acute conditions could be stopped before they become chronic.

Due to the need of on-site medical attention, secondary to the high injury rate of rodeo, Dr. Pat Evans of Fort Worth, Texas, established the Justin Healer Sports Medicine program in 1977. Don Andrews, an athletic trainer working with Dr. Evans, travels to professional rodeos throughout the United States in a truck and trailer that is stocked with the latest equipment. A variety of medical services are provided to the cowboys. Locally, Butch Keller, a physical therapist at Med Center One in Bismarck, ND, has modeled a program after the Justin Healer Sports Medicine Program. Mr. Keller currently travels to 80-90 local rodeos a year. Unlike the Justin Healer program, which serves mainly professional rodeos, Keller attends high school, amateur and professional events.[5]

The purpose of this paper is to inform physical

therapists about the sport of rodeo. It will examine the events and mode of injury. This paper will also give insight to the atmosphere and attitudes that surround the sport.

By accomplishing this, physical therapists will have a better understanding of rodeo and its events. Foundations will be laid for improved patient care.

CHAPTER 2

HIGH RISK EVENTS

There are eight rodeo events that will be discussed as high risk events. They will be discussed in order of highest to lowest risk, according to Griffin et al.[2] Three of these events are roughstock events that include bull riding, bareback riding and saddle bronc riding. The remaining five events are timed events that include steer wrestling, team roping, calf roping, goat tying and barrel racing.

In a study done by Meyers et al[3] bull riding, bareback riding, saddle bronc riding, and steer wrestling account for 92% of injuries. Roping and barrel racing made up the remaining 8%.

Bull Riding

Bullriders hold on to a flat braided rope. A rope is wrapped around the bull and the tail is pulled through a loop. The cowboy then wraps the rope around his riding hand to secure his grip. A glove is worn and rosin, a material that becomes sticky when friction occurs, is applied to allow a more secure handhold. The cowboy then attempts to ride the bull for eight seconds. During the ride, the

cowboy sits directly above his arm and attempts to hold his center of gravity over his hand. This reduces the amount of stress on the shoulder, however, the stress on the wrist and elbow remains significant. The majority of the injuries in the bull riding occur when the rider is dismounting the bull. The rider is at risk of "hanging up", which means he is unable to release his hand from the rope. If this occurs, the rider is drug and flung about by the bull. This creates a distraction force on the upper extremity and accounts for axial injuries.[4] It also puts the cowboy in danger of being gored or stepped on. (Fig. 1)

Bareback Riding

Bareback riding is considered to be the most physically demanding event in rodeo. Bareback riders grasp a rigging, a handhold made of leather and rawhide that is secured to the horse with a cinch, with a gloved and rosined hand. During the attempted eight-second ride, the cowboy attempts to lean back with the legs held in external rotation while flexing and extending the hip and knee flexors. Enormous physical stress is placed on the arm and back, and these riders face long-term injuries affecting the elbow and low back areas.

Ideally, the cowboy should hold his arm in approximately 60 degrees of flexion; this position still puts considerable stress on the shoulder, elbow, and wrist joints and their surrounding muscles. If the cowboy loses control

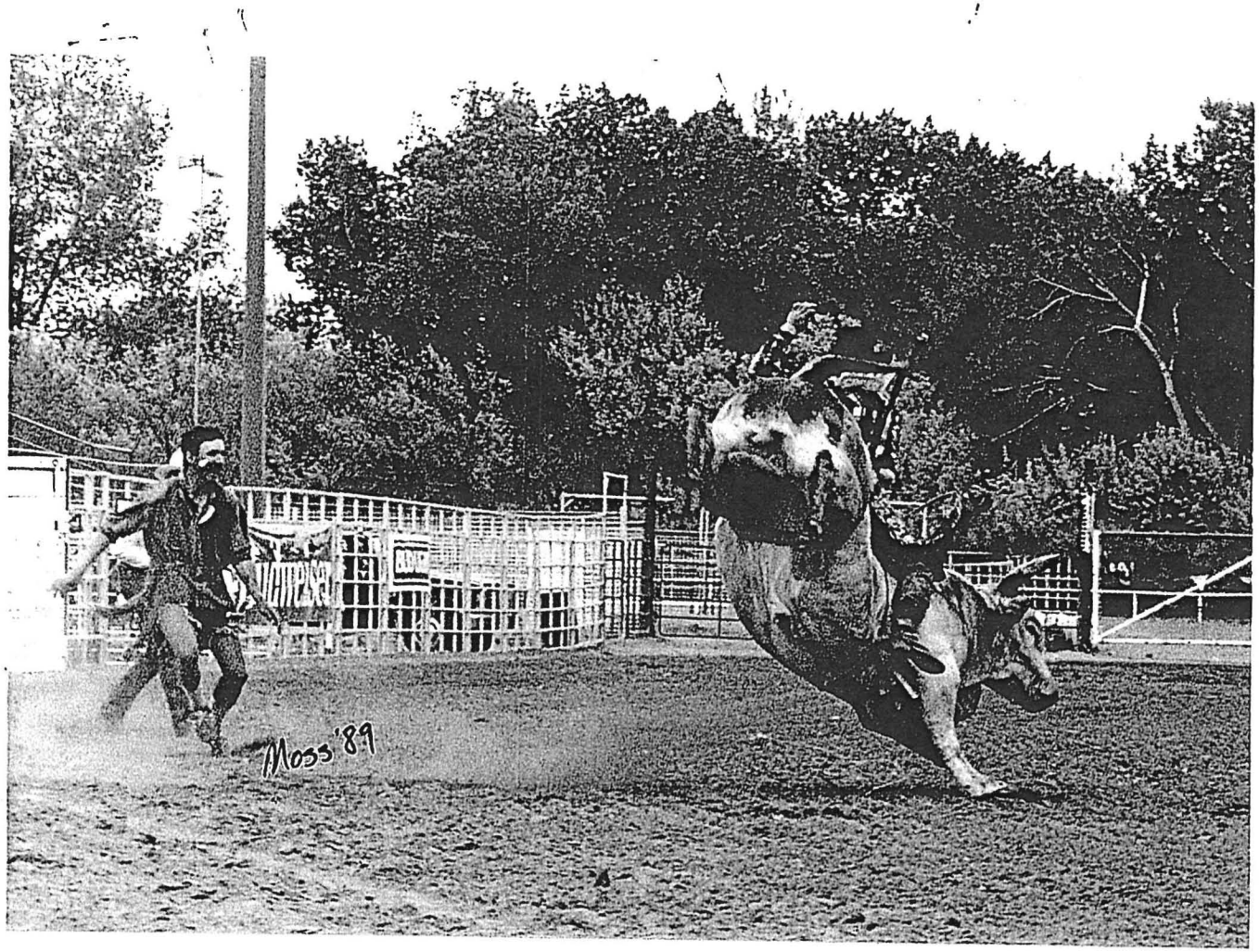

Figure 1. Bull Riding

during the ride and the arm is fully extended, the possibility for injury greatly increases. There is a direct pull on the entire upper extremities due to the force of the horse bucking against the contestant's body weight. The elbow, which is the most frequently injured site, is often damaged when this type of hyperextension is applied to the joint.[4]

There is an increased possibility of "hanging up" during dismount due to the tight fit of the glove in the rigging. This accounts for brachial plexus injuries, dislocated shoulders, head injuries, rib injuries and spinal injuries. (Fig. 2)

Steer Wrestling

Steer wrestling, also called bull dogging, involves the cowboy attempting to wrestle the steer to the ground using only leverage and strength. While running down the arena, the steer wrestler slides down the right side of his horse and hooks his right arm around the steer's right horn and grasps the left horn in his left hand. He then digs his heels deep in the dirt and uses the leverage to bring down the steer.[6] A "hazer" is an important member of this team, since he rides on the opposite side, keeping the steer running straight. If the steer does not run in a straight line, there is good possibility that the steer wrestler will be out of position, which increases the chance of injury.

Steer wrestlers often have chronic knee conditions,

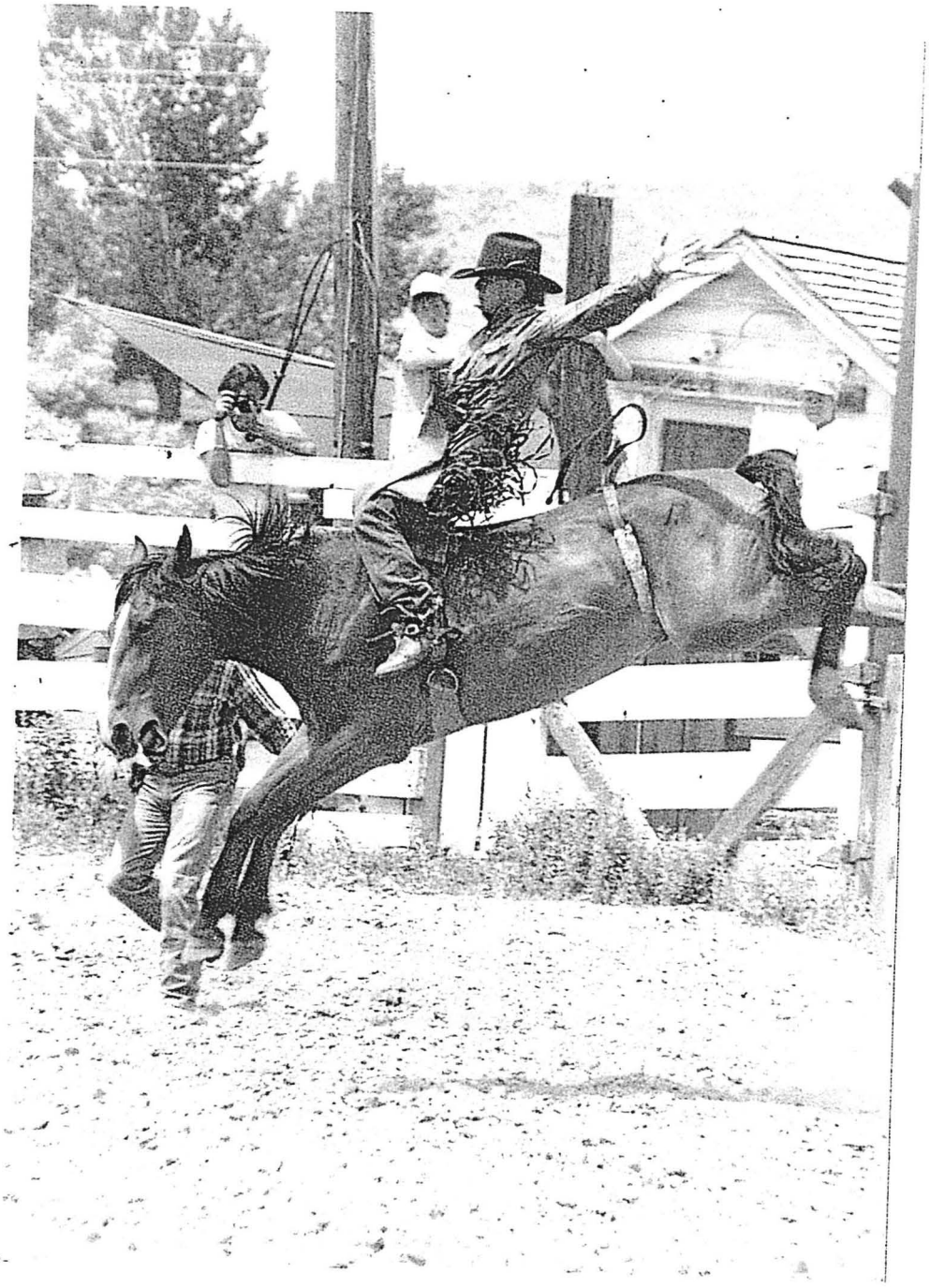

Figure 2. Bareback Riding

which occur after years of competition. When the cowboy slides from the horse and reaches for the steer, there is great stress put on knee and ankle joints. The momentum of using ones legs to slow the steer increases the risk of injury. However, if the cowboy fails to keep correct form, his knees can buckle, creating the possibility of ligamentous or cartilage damage. The contestant is also at risk for injury by the steer's horns and the horses that are running at considerable speed past him as he dismounts. (Fig. 3)

Saddle Bronc Riding

Saddle bronc riders use a saddle and a rein to stay mounted on the horse. During the eight-second ride, the cowboy attempts to spur the horse. The rider is able to use the stirrups to put his weight in, which increases his balance. He can use the adductors in his legs to help him stay mounted. The rein is also used as a balancing point and is held without a glove or rosin, which eliminates the chance to "get hung up" by his hand. The majority of the injuries in the bronc riding occur on the dismount. Riders are at risk for hanging up a foot in the stirrup and being drug by the horse. However, the stress is still great on the dominant upper extremity and can lead to chronic and acute inflammation, sprains and strains of major joints. (Fig. 4)

Figure 3. Steer Wrestling

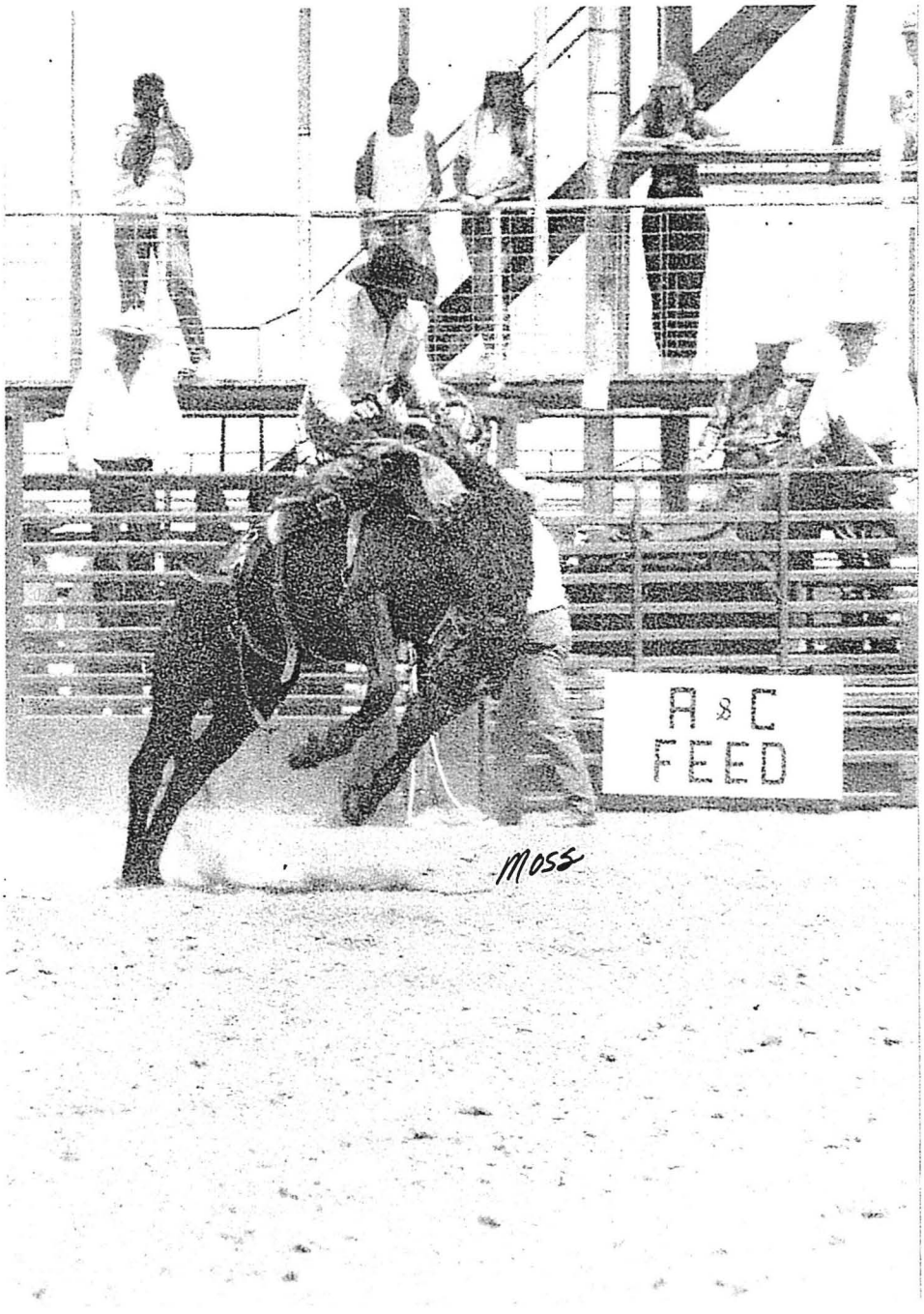

Figure 4. Saddle Bronc Riding

Team Roping

Team roping consists of two cowboys roping the head and heels of a steer. The rope is usually made of nylon or a mixture of dacron, poly or other synthetic material. When a catch is made, the cowboy dallys to the horn of the saddle, which consists of making a complete turn around the horn with the rope. The weight of the steer is against the rope, and the momentum can lead to slipping or jerking the rope through the roper's hand. This leads to a burn on the metacarpalphalangeal area. If the rope gets wrapped around one or more MCP, it can twist it off, in which case microsurgery or amputation is needed. (Fig. 5)

Calf Roping and Goat Tying

Calf roping consists of a cowboy throwing his rope around a calf's neck. After catching the calf, his horse comes to a stop and the cowboy dismounts. The cowboy then runs down the rope, throws the calf to the ground, and ties three legs of the calf. (Fig. 6)

Goat tying consists of a cowgirl riding down the arena toward a goat that is secured by a staked rope. The cowgirl dismounts and runs to the goat, throwing him to the ground and tying three legs. (Fig. 7)

Calf roping and goat tying are sports in which injuries can be sustained to the knee and ankle regions. These sports both consist of dismounting from a horse while the horse is going from a hard run to a stop. In some cases,

Figure 5. Team Roping

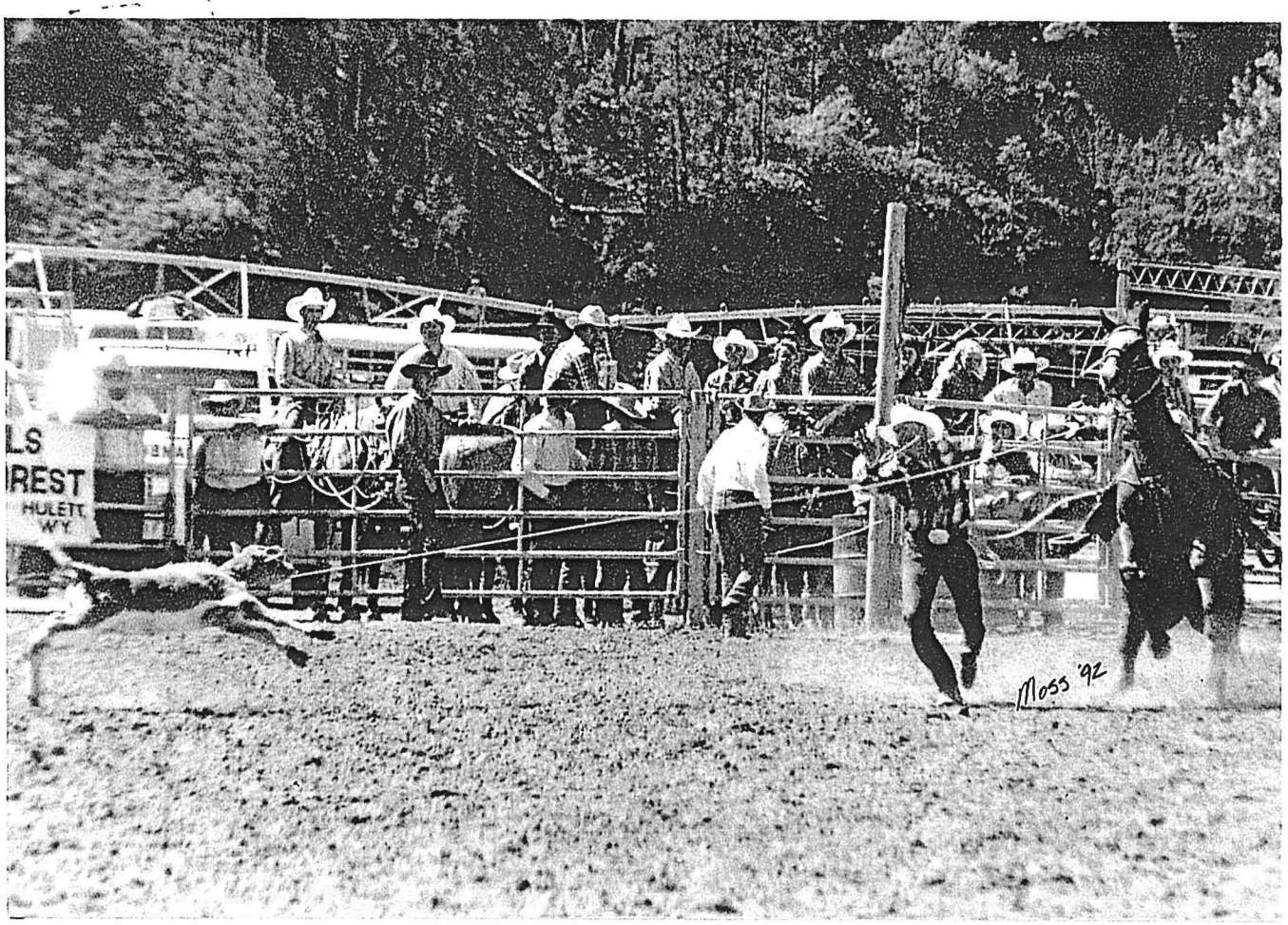

Figure 6. Calf Roping

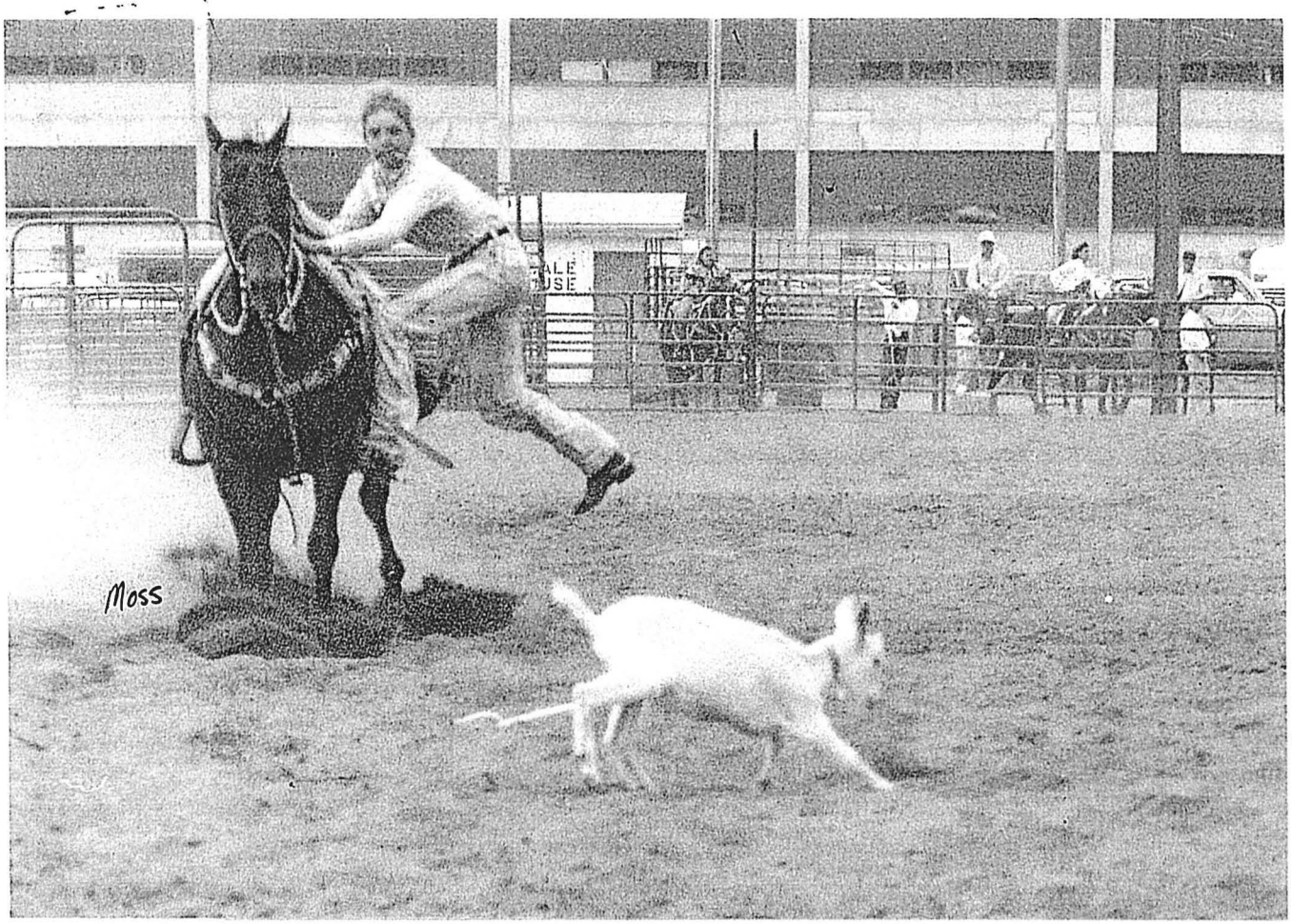

Figure 7. Goat Tying

the goat tiers' horses are not coming to a stop at all, but merely slowing down. This presents the opportunity for lower extremity injuries. The momentum and speed of the horse and the direction to which the goat or calf is going leads to cutting at a rapid pace, and the sudden impact of hitting the ground running are all variables that factor in to the injury rate of the contestant. The calf roping shows to have a low injury rate.[3,4] Goat tying is included on the collegiate and high school levels, and on these levels, only females participate in this event. It is common knowledge among these athletes that there are often injuries to knees and ankles. However, there is limited research information on the goat tying event.

Barrel Racing

Barrel racing is an event consisting of a cowgirl racing her horse around three barrels in a cloverleaf pattern. Speed and quick turns are essential in this event. Trying to cut seconds off their time, cowgirls come very close to the barrels when turning. If the horse comes too close, the cowgirl's knee can be smashed into the barrel. Many cowgirls wear shin guards to protect their legs. This greatly decreases the amount and degree of lower extremity injuries seen in this event.

In the barrel racing event, horses run at high speeds and turn sharply. This increases the horses chance of falling and possibly landing on the cowgirl. This puts the

cowgirl at risk for lower extremity or other unpredictable types of injuries. The type of injury greatly depends on how the horse falls. This mode of injury is uncommon, explaining the limited amount of information available concerning the barrel racing event. (Fig. 8)

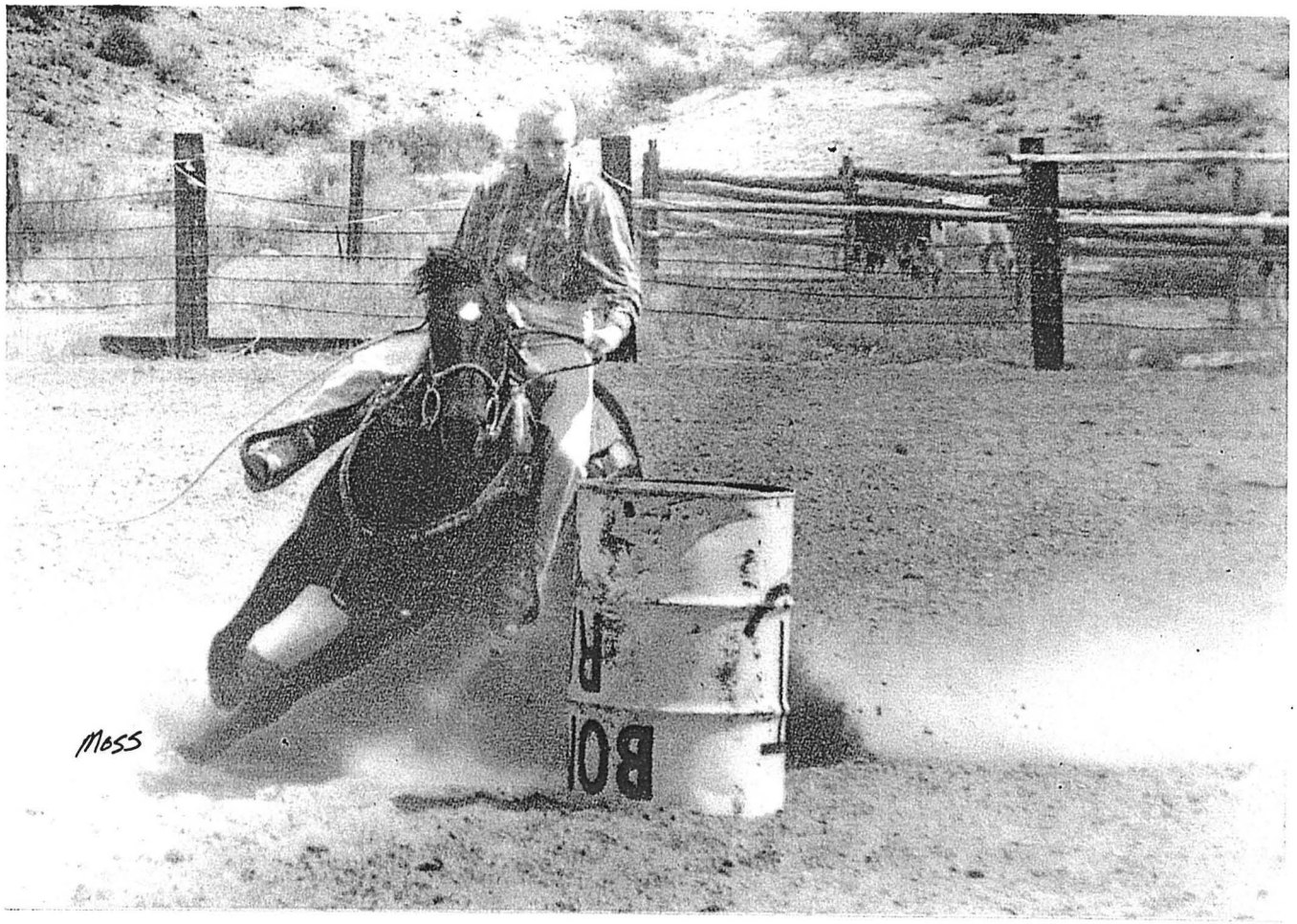

Figure 8. Barrel Racing

CHAPTER 3

COMMON INJURIES IN RODEO

Rodeo accidents produce injuries that often affect common areas. This is due to the techniques attempted in each event. These typical injury sites should be kept in mind when evaluating a rodeo injury.

Elbow

One of the most common injury sites is the elbow. Roughstock riders have a good chance that they will encounter an elbow injury sometime in their career. Most of the injuries are contusions or hyperextension injuries.[2] The biomechanics of the forces applied to the upper extremity during the bareback riding, and forces that can occur during and after dismount in the bull riding produce anterior compartment injuries. For example, bareback riders are subject to forceful hyperextension movements during the ride, and bull riders are subject to ballistic jerks if they are hung up in the rope. Both of these actions can lead to anterior elbow pain. This can be caused from anterior capsular sprain, flexor-pronator strains, bicipital tendinitis, the presence of intra-articular loose bodies, or rupture of the distal bicipital tendon.[7] Other possible

injuries can include lateral compartment problems such as lateral epicondylitis, avulsion injuries, or articular changes in the capsule.[7] The posterior compartment can also be affected by olcranion fractures, bursitis, and ulnar nerve involvement. Medial compartment injuries include medial epicondylitis, ulnar collateral ligament sprain, flexor pronator strain, or stress fractures of the medial epicondyle. Peripheral nerves, such as musculocutaneous, radial, median, and the previously mentioned ulnar, can also be injured and should be recognized. Fractures, avulsion fractures and vascular problems should also be kept in mind when performing an evaluation of an elbow injury or complaint of pain.

Wrist

The wrist is another common injury site. There are four major mechanisms of wrist injuries in athletics: throwing, weight bearing, twisting, and impact.[8] Twisting and impact mechanism are most common in rodeo events. Cowboys are at risk for fractures to the bony structure of the wrist. They are also susceptible to tendinitis and overuse syndromes. A thorough evaluation should be done, looking at a wrist injury or investigating a complaint of pain and/or weakness. This will ensure a proper diagnosis and treatment of the athlete's complaint of pain.

Groin

An injury to the groin is an area of concern with most

cowboys. Adductors are often over-stressed in the roughstock events since they are the major muscle group used to stay on the animal. Calf ropers, team ropers and steer wrestlers are also at risk for a groin pull, since riding a horse involves extensive use of adductors.

Shoulder

The shoulder is at risk for injury since it is a very mobile joint. Anterior dislocation accounts for 90% of shoulder dislocations.[9] This most commonly occurs when the roughstock athletes are hung up in their rope during a dismount. A subluxation or dislocation injury has a re-injury rate as high as 85%.[9] Bursitis and tendinitis are common among these athletes. This is due to the great stresses on the shoulder joint during riding events and repetition of movement in roping events.

Back

Rodeo athletes are also at risk for back injuries. Injuries can be caused by getting stepped on by the livestock, hyper or hypomobility in the adjacent joints[10] or "landing wrong" when thrown from the livestock. This can result in a violent twisting blow to the spine, creating a possibility of discal and musculoskeletal injuries.

Knee and Ankle

The knee and ankle are two common injury sites. Means of injuries in roughstock riders can be smashed in the chute before the ride begins, as he leaves the chute or during the

dismount. Calf ropers and goat tiers are at risk during dismount of their horse onto the arena floor. The floor is an uneven surface and can vary from being hard and shallow to deep and sandy. The sand is the most dangerous since it tends to be deep and unstable. Dismounts here lead to knee injuries, ankle injuries and lower extremity fractures.

CHAPTER 4

PHYSICAL THERAPY INTERVENTION

Meyers et al[3], suggested that the injury rate of rodeo athletes may be decreased by a greater understanding of training techniques, injury prevention, and post injury care. These factors can be addressed by using sports physical therapy techniques and training. Physical therapists are trained to have good evaluation techniques of acute and chronic injuries. They also are trained in aspects of prevention and rehabilitation of injuries. Using these skills, physical therapists can treat acute and chronic injuries as well as stressing preventive measures. Education is very important and should be included when treating rodeo athletes. By combining a good understanding of rodeo injury and stressing useful education, compliance will undoubtedly be improved and future injury rates decreased.

Stretch and Strengthening

Stretching and strengthening exercises are beneficial methods in rehabilitating musculoskeletal related injuries. The exercises are important in regaining optimum performance and preventing re-injury.

Exercises to event specific muscle groups will ensure that the injury and pain cycle is halted. Basic, traditional strengthening and stretching techniques can be applied to the elbow, wrist, knee and ankle joints. These joints are at risk for injury during most rodeo events and should be target areas for an exercise program.

For groin injuries, stretches should be done before every ride, and isometric exercises can be done at home to strengthen the musculature.[10] Back injuries should be evaluated and treated by using basic techniques in back rehabilitation; extension and flexion exercises will increase flexibility as well as strengthen appropriate musculature. Shoulder injury rehabilitation should consist of a strengthening program targeting the deltoid, pectoralis muscle group, latissimus dorsi, teres major and the rotator cuff muscles; flexibility and range of motion should also be incorporated. Functional activities specific to individual events can be added to all exercise programs for a more effective outcome.

Prevention

Those working with and treating rodeo athletes need to stress the importance of stretching, strengthening and conditioning. These athletes often are ignorant of the importance of being fit and have no knowledge of how to get into shape.[11]

Stretching is essential for roughstock riders, but it

is also important when competing in all other events. Static stretching is recommended and should be done in major muscle groups. The shoulder girdle should be properly stretched. The adductors, hamstrings, neck and low back, should also be included. This will improve flexibility and decrease stress, thus reducing the risk of injury.[12]

Strengthening is also important in all athletes. It has been shown that increased strength will improve performance and decrease the chance for injury.[13] Plyometric exercises would be an excellent method to improve a cowboy's agility and strength.

An effective aerobic training program is important to improve overall sport performance. Improvements in aerobic capacity can be achieved in a short time, providing a foundation for improvements in a specific event. There are many practical ways to improve your cardiovascular system, such as jumping rope, cycling, swimming or running. The exercise program should allow individualized conditioning that will supplement the workout regimen. Unless programs are customized to each individual's goals, physically and psychologically, compliance decreases, performance suffers and unnecessary injuries may occur.[14]

Acute

Modalities can be used to treat acute injuries. Ice or coolant sprays would most commonly be used to treat sprained ankles, groin pulls, tendinitis in the forearm, elbow, or

wrist. Athletes that have been stepped on by livestock would benefit from an ice massage to decrease pain, swelling and tightness. Electromagnetic stimulation, ultrasound and moist heat are also treatment possibilities of acute injuries. These modalities can be applied to acute back sprain or strain as well as knee and shoulder injuries. The above modalities have been thoroughly tested and the indications, contraindications, and effects have been researched and documented.

Wound care is also important whether it be first aid before the ambulance gets there, or immediate treatment of minor injuries such as cuts, burns, scrapes, and contusions. Modern wound care techniques can be applied to these athletic injuries. Early treatment of minor wounds can prevent infection and ensure proper healing.

Long-term/Chronic

Taping is an excellent way to treat an athlete and allow him/her to return to their event. Taping bareback riders' forearms and wrists can reduce the medial and lateral compartment pain often found in these athletes. By giving the muscle an outside counter force, it can relieve the pain of muscle strain. These riders can also benefit from taping the elbow at a 60-degree angle to eliminate forced extension or hyperextension during a ride. Bull riders and saddle bronc riders can also benefit from forearm taping or taping of the wrist only; the hand must be free of

tape to enable the rider to put on his glove, which is very tight. Calf ropers and goat tiers most commonly require ankle taping. This can be done in the common style used for other athletes that perform quick, cutting moves at high speeds. Taping hypermobile ankles can add stability by decreasing range of motion and increasing proprioception of the ankle joint.[15] Lace-up cowboy boots can also decrease the risks for ankle injuries. Groin pulls, seen with athletes in all rodeo events, will benefit with a hip spica taping technique. Any athlete may break metacarpal and/or phalanges and require splinting and taping.[16] Techniques used in traditional sports medicine may be applied to rodeo athletes, but may require modifications unique to the individual event.

Education

The most important part of injury prevention and rehabilitation is education. Athletes should be made aware of the risk factors that may predispose him/her to an injury. The injury itself will not make an impression, but missed rodeos, decreased performance levels, and fewer winnings will be understood.

Five risk factors are overdoing it, inadequate equipment, poor conditioning, improper techniques, and ignoring aches and pains.[17] These factors apply to every athlete on every level. Athletic trainers and physical therapists can work with rodeo athletes to create a program

to match their needs. Most rodeo competitors do not have access to a modern workout center, but simple activities such as walking, jogging, bike riding and jumping rope can be suggested. A simple stretching routine, emphasizing target areas specific to each event, can be offered to reduce the injury rate. The medical professional can also stress the need for the athlete to pay attention to aches and pains, and receive help for them early before they turn into a major problem.

One major area of concern is improper technique. The increase injury risk in the roughstock events makes it very important that those who are just learning to ride learn from a reputable teacher. Ignorance of safety techniques increases the chance of injury in events already considered high risk.

Compliance

Rodeo athletes compete on an individual basis; they do not have teams covering expenses. As Donny Gay, eight-time World Champion stated, "When a rodeo cowboy gets injured, the pay checks stop. There never was any salary to start with, much less injured reserve; and the cowboy must get back on the road as a simple means of economic survival. It's simple: unless you're there to put your hand in the bull rope, you've lost your chance at winning any money. If you're hurting, you don't go home - - you just get in that car or plane and try to heal on the way to the next one."

The cowboy's lifestyle does not provide the time needed to seek proper medical care. On-site care will help improve compliance.

The stigma that is associated with cowboys is that of independence. To a cowboy, depending on others is a weakness. By educating contestants that proper care can improve performance, decrease pain, and lead to winning, the cowboy will understand and be more willing to accept medical attention and comply with individual exercise programs. An educated medical provider will also improve acceptance. By understanding rodeo events and mode of injury, a trainer or therapist will better serve the contestant.

Future Considerations

There is a major need for research concerning rodeo injuries. As Meyers et al[3] suggested, use of protective gear (i.e., helmets and back pads) could greatly decrease injuries. Strengthening programs that are sport specific also need expansion.

The medical community needs to acknowledge the sport of rodeo and its contestants. Until medical providers are familiar with the sport, their care of these athletes will be compromised. Although these cowboys are treated just as any other patient would be treated, the physical therapist should be aware of how the injury occurred, as well as what is involved when the patient returns to the rodeo arena. By being aware of the potential problems, the patient and the

physical therapist will have the same goals, and injury management will be efficient and effective.

CHAPTER 5

SUMMARY

This paper has attempted to give an overview of the history of rodeo and the heritage that has created the unique attitude and atmosphere that surround this sport. It also explains specific events and common injuries that can occur while performing in the rodeo arena. Treatment suggestions have been given regarding specific injuries in an attempt to explain necessary modifications of traditional treatment methods. By accomplishing this, physical therapists will have a better understanding of rodeo. This will enable them to deliver medical care more efficiently, improving patient care.

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